

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-001304

(43)Date of publication of application : 06.01.1998

(51)Int.Cl.

C01B 21/064

B01J 19/12

(21)Application number : 08-191318

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(22)Date of filing : 17.06.1996

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(54) PHOTOEXCITATION PRODUCTION OF FOUR COORDINATE BOND BN MATERIAL

(57)Abstract:

PROBLEM TO BE SOLVED: To enable the production of a semiconductor which requires high purity and a high degree of control in compsn. and structure by irradiating a raw material, such as boron nitride, formed by sp² hybrid bonding with a high energy density of ultra-short pulses of IR rays resonating with the out-of- plane vibration mode thereof.

SOLUTION: (i) Any of the powder, sintered compact or single crystal of any among BN consisting of the bonds by the sp² hybrid loci, i.e., hBN (hexagonal BN), rBN(rhombic BN), pBN (thermally decomposed BN), tBN (turbulent laminated structure BN), α -BN(amorphous BN) (these are described as an sp² phase) is used as the raw material and (ii) the raw material is irradiated at the high density with the ultra-short pulse laser beam resonating with the vibration mode displaced perpendicularly to the plane inclusive of the bonds consisting of the sp² hybrid loci, by which the four coordinate bond BN (described as the sp² phase), such as BN (cubic BN) or wBN (wurtzite type BN) material, consisting of the bonds by the sp³ hybrid loci is produced.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平10-1304

(43) 公開日 平成10年(1998)1月6日

(51) Int.Cl. ⁶	識別記号	庁内整理番号	F I	技術表示箇所
C 0 1 B 21/064			C 0 1 B 21/064	M
B 0 1 J 19/12			B 0 1 J 19/12	B
				H

審査請求 未請求 請求項の数5 書面 (全 4 頁)

(21) 出願番号 特願平8-191318

(22) 出願日 平成8年(1996)6月17日

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(54) 【発明の名称】 四配位結合BN材料の光励起製造法

(57) 【要約】

【目的】従来の高圧高温条件によらぬ四配位結合窒化ホウ素、即ちcBN、wBN等の製造法を提供する。

【構成】s p² 混成結合による窒化ホウ素、hBN等の無処理あるいはドーブ用の処理をした原料にその面外振動モードに共鳴する赤外線の超短パルスの高エネルギー密度の光を照射して四配位結合窒化ホウ素を製造する。付随する処理法により半導体素子の構造と機能を作り込む。

